

**REMARKS**

Claims 1-4 and 6 remain pending in the application. No claims are currently amended, cancelled, or added. Claims 5 and 7 were previously cancelled.

Claims 1 and 6 stand rejected under 35 USC §103(a) over Mine et al. (USPN 5872170). Claims 2-4 have been objected to as being dependant from a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The Applicants respectfully request the Examiner to reconsider the rejections of independent claim 1 as obvious over Mine et al. on the bases that:

1) The Comparative Examples contained in the instant application provide clear evidence that silicone oils having only five silicon atoms are not capable of forming a homogeneous composition, whereas similar silicone oils having greater numbers of silicon atoms were shown to successfully form homogeneous compositions (thereby providing evidence of criticality of the instantly claimed ranges for the value of “n” in independent claim 1, which is indicative of non-obviousness of the instantly claimed silicone oils having at least seven silicon atoms);

2) Mine et al. merely teaches an extremely broad laundry list of various components that can be included in the compositions that are taught therein, including optional components such as adhesion promoters described in column 17, line 28 to column 18, line 27, that may broadly encompass the silicone oils described by (A<sub>1</sub>) and (A<sub>3</sub>) in the instant independent claim 1, but such broad teachings do not reasonably suggest to a person of skill in the art to use the silicone oils claimed in the instant claims;

3) Specific Examples of Mine et al., which are more indicative of the actual teachings thereof than broad disclosures of all manner of adhesion-promoting agents provided in column 17, line 28 to column 18, line 27 (as used by the Examiner to find teachings in Mine et al. of the instantly claimed (A<sub>1</sub>) and (A<sub>3</sub>)), and which are more useful to determine how one of skill in the art would have reasonably interpreted the broad teachings of Mine et al. as referenced in 1) above, utilize silicone oils that have **only five** silicon atoms, whereas the silicone oils described by (A<sub>1</sub>) and (A<sub>3</sub>) in the instant independent claim 1 have a minimum of seven silicon atoms;

4) Mine et al. specifically describes other silicone oils, such as methyltrimethoxysilane, as equally suitable as other silicone oils described therein, such as the silicone oils represented by the formula in column 17, lines 40-47 that the Examiner has used as a basis for equation to the instantly claimed silicone oils, and the Comparative Examples contained in the instant application prove that methyltrimethoxysilane is incapable of successfully forming homogeneous compositions, whereas identical amounts of silicone oils in accordance with claim 1 of the instant claims enabled successful formation of homogeneous compositions (also indicative of non-obviousness of the instantly claimed silicone oils); and

5) Mine et al. teaches use of the silicone oils represented by the formula in column 17, lines 40-47 for adhesion promotion properties thereof, and one of skill in the art, when faced with the problems of the instant inventors of seeking a silicone oil that can successfully form a homogeneous composition while also achieving a high content of heat conductive filler, would not reasonably have been expected to isolate specific silicone oils meeting the elements of (A<sub>1</sub>)

or (A<sub>3</sub>) as claimed in independent claim 1 from the broad class of silicone oils of Mine et al. that are specifically taught for use as adhesion promoters within the composition of Mine et al.

To supplement arguments 1)-5) above, the Applicants provide additional specific arguments and detail in the following paragraphs.

The Applicants substantially concur with the Examiner's findings regarding the explicit teachings of Mine et al., and the Examiner's conclusion that Mine et al. does not explicitly disclose silicone oils with the number of repeating units being from 5 to 100 as claimed in independent claim 1 of the instant claims. The Applicants note that the entire basis of the Examiner's obviousness rejection of independent claim 1 is the fact that Mine et al. teaches silicone oils represented by the formula in column 17, lines 40-55, with the repeating portion of the silicone oils designated by the subscript "m" and with "m" being merely described as "a positive number". The Examiner has held that these teachings of Mine et al. would suggest to a person of skill in the art polysiloxanes which satisfy the numerical requirements of "n" in independent claim 1 of the instant claims.

Of particular relevance to the instant analysis is the treatment of claimed ranges under the 35 U.S.C. §103 obviousness standards, which are addressed in MPEP 2144.05. In general, in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Notably, **Applicants can rebut a *prima facie* case of obviousness based on overlapping ranges by showing the**

**criticality of the claimed range, generally by showing that the claimed range achieves unexpected results relative to the prior art range.** See MPEP 2144.05(III).

Independent claim 1, as previously noted, specifies that there is a minimum of seven silicon atoms that are **always** present in the silicone oils described by (A<sub>1</sub>) and (A<sub>3</sub>) (at least five silicon atoms are contributed from the group whose presence depends upon the value of “n”, at least one additional silicon atom is contributed depending upon the value of “c” or “e” in formulas (A<sub>1</sub>) and (A<sub>3</sub>), respectively, and a further silicon atom is contributed which is bonded to the alkoxy group(s)). Depending upon the particular embodiment, there may be more silicon atoms present in the silicone oils described by (A<sub>1</sub>) and/or (A<sub>3</sub>). In fact, the specific Examples included in the application each make use of silicone oils having more than seven silicon atoms per molecule.

As noted under argument 1.) above, the Comparative Examples contained in the instant application are very useful for proving the criticality of the claimed ranges for the value “n” and, therefore, prove the non-obviousness of the instantly claimed silicone oils over the broad teachings for the variable “m” in Mine et al., which for argument’s sake are deemed to encompass the instantly claimed range for the variable “n”. Comparative Example 2 in the instant application illustrates an inability to even make a homogeneous heat conductive silicone grease when a silicone oil having a total of only five silicon atoms is used, while homogeneous heat conductive silicone grease was successfully made under the same conditions as Comparative Example 2 using silicone oils that are substantially identical to the silicone oils used in Comparative Example 2 but that have more silicon atoms (see, e.g., Examples 1 and 3).

As such, the Examples and Comparative Examples of the instant application clearly illustrate the effect of the number of silicon atoms in silicone oils on the ability to even form homogeneous heat conductive silicone grease. Thus, criticality of the number of silicon atoms present in the silicone oils of the instant claims is clearly proven such that the Examiner's *prima facie* case of obviousness of independent claim 1 is overcome.

The Applicants further submit that specific teachings of Mine et al. provide additional evidence of non-obviousness of the instantly claimed values for the variable "n" in independent claim 1. In particular, as summarized in argument 3) above, Mine et al. includes a specific example of a composition including a silicone oil having the formula represented in column 17, lines 40-55 (see Example 3 of Mine et al.). Notably, the silicone oil of Example 3 in Mine et al. **only has five silicon atoms, which is below the minimum number of silicon atoms for the instantly claimed silicone oils.** Further, the Comparative Examples of the instant application even prove that silicone oils having the same number of silicon atoms as those in Example 3 of Mine et al. result in failure to achieve a homogeneous composition when compared to use of silicone oils in accordance with independent claim 1 of the instant claims. Further still, as summarized in argument 4.) above, Mine et al. equates methyltrimethoxysilane as an equally effective adhesion promoter to the silicone oils represented by the formula in column 17, lines 40-55. Comparative Example 1 of the instant application illustrates the ineffectiveness of methyltrimethoxysilane for purposes of achieving a homogeneous composition. The facts serve to further illustrate the non-obviousness of the instantly claimed compositions over the teachings of Mine et al.

In view of the foregoing, the Applicants respectfully submit that independent claim 1 is both novel and non-obvious over the teachings of Mine et al., and the Applicants respectfully request favorable reconsideration of the rejection of independent claim 1 over Mine et al. as asserted by the Examiner.

This response is timely filed; thus, it is believed that no further fees are presently due. However, if necessary, the Commissioner is authorized to charge Deposit Account No. 08-2789, in the name of Howard & Howard Attorneys, P.C. for any additional fees or to credit the account for any overpayment.

**Respectfully submitted,**

**HOWARD & HOWARD ATTORNEYS PLLC**

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Date

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